

Amendments to the Drawings

The attached replacement drawing sheet includes changes to FIG. 4. This sheet, which depicts FIG. 4 only, replaces the original sheet that depicted FIG. 4 only. In FIG. 4, a reference character "147" and associated leader line that refer to the lower surface of the sleeve have been added to the lower right portion of FIG. 4. Previously, the drawings did not include reference character 147, which is described in the specification at least in the paragraph beginning at page 8, line 3. No new matter has been added.

Attachment: Replacement Sheet
Annotated Sheet Showing Changes

Remarks

In view of the following remarks, reconsideration and further examination are respectfully requested.

Claims 1, 14 and 26 have been amended, and claims 50-55 have been added. Support for added claims 50, 52 and 54 can be found in at least FIG. 4, and support for added claims 51, 53 and 55 can be found in at least the paragraph beginning on page 12, line 18 of the specification. No new matter has been added. As such, claims 1-55 are currently pending.

Claims 5, 17, 44 and 45 have been withdrawn. Consequently, claims 1-4, 6-16, 18-43 and 46-55 are currently pending and under consideration.

Claim 39 is indicated allowable if placed in independent form. The rest of the claims are rejected. Reconsideration and allowance are respectfully requested for the following reasons.

Amendments to the Drawings

Proposed drawing amendments, which include a replacement sheet and an annotated sheet showing changes, are submitted with this amendment. The attached drawing sheet includes changes to FIG. 4. This sheet, which depicts FIG. 4 only, replaces the original sheet that depicted FIG. 4 only. In FIG. 4, a reference character "147" and associated leader line that refer to the lower surface of the sleeve have been added to the lower right portion of FIG. 4. Previously, the drawings did not include reference character 147, which is described in the specification at least in the paragraph beginning at page 8, line 3. No new matter has been added.

Amendments to the Specification

Applicant has amended the paragraph beginning at page 5, line 2, and the paragraph beginning at page 8, line 3 to correct typographical errors. Applicant respectfully submits that no new matter has been added.

Claim Rejections Under 35 U.S.C. § 103

The Office has rejected claims 1-4, 6-10, 14-16, 18-25, 27-38, 40-43, 46 and 49 under 35 U.S.C. §103(a) as being unpatentable over Martin (U.S. Patent No. 4,305,348) in view of Zurfluh (U.S. Patent No. 6,357,758) and Bock (U.S. Patent No. 6,145,481). Applicant respectfully traverses and asserts: 1, the Office has not established a *prima facie* case of obviousness; 2, that the Office is using impermissible hindsight in its analysis; 3, that there is no motivation to combine the references with Martin actually teaching away from Bock; 4, that, even if assuming the references are properly combinable, there is no motivation to make a single-piece structure; 5, that there is no reasonable expectation of success if the references are combined since the references are not physically combinable while following the reference teachings; and 6, that three enclosed declarations by experts in the industry and a webpage article indicate the present invention is not obvious.

In support of this assertion, Applicant offers a brief summary of the relevant law and its interpretation by the USPTO: "To establish a *prima facie* case of obviousness, ... there must be some suggestion or motivation, either in the references themselves, or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings [and] there must be a reasonable expectation of success." MPEP §706.02(j) (citing *In re Vaeck*, 947 F.2d 488, 20 USPQ.2d 1438 (Fed. Cir. 1991)). "[T]he examiner must

show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed.” *In re Rouffet*, 47 USPQ2d 1453, 1458. As held by the Federal Circuit, “[t]hese findings or evidence must be specific, clear, and particular.” *In re Lee*, 61 USPQ 2d 1430, 1433-34 (Fed. Cir. 2002). “Broad conclusory statements regarding the teaching of multiple references, standing alone, are not [considered sufficient] ‘evidence’” to support a finding of *prima facie* obviousness. *In re Dembiczak*, 50 USPQ 2d 1614, 1617 (Fed. Cir. 1999); *See also, Ex Parte Levengood*, 28 USPQ 2d 1300, 1301 (Bd. Pat. App. & Int. 1993).

“It is impermissible to use the claimed invention as an instruction manual or ‘template’ to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that ‘[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.’” *In re Fritch*, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992) (citing, *In re Fine*, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988)).

“The level of skill in the art cannot be relied upon to provide the suggestion to combine references.” MPEP § 2143.01 (citing *Al-Site Corp. v. VSI Int’l, Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999)). When the Examiner and the Board “rely on what they assert to be general knowledge to negate patentability, that knowledge must be articulated and placed on record.” *In re Lee*, 277 F.3d 1338, 1345, 61 USPQ2d 1430, 1435 (Fed. Cir. 2002). “The Board cannot rely on conclusory statements when dealing with particular combinations of prior art and specific claims, but must set forth the rationale on which it relies.” *Id.*

“A prior art reference must be considered in its entirety, i.e., as a *whole*, including portions that would lead away from the claimed invention.” MPEP §2141.02 (*citing, W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540; 220 USPQ 303 (Fed. Cir. 1983)).

No Prima Facie Case of Obviousness Has Been Established

Although read carefully several times, the Office Action does not seem to indicate any motivation to combine Martin with either Bock or Zurfluh. The reasons given for the rejection refers only to heat dissipation properties allegedly associated with Bock and Zurfluh, and are summarized in the Office Action as:

It would have been obvious to modify Martin by making the spacer elements as taught by Bock (to include a boss portion) and to make the face of the gasket as taught by Zurfluh because Bock taught the heat dissipation advantages of his spacer structure and Zurfluh simply illustrated the need to make any spacer or gasket with orifices for coolant flow and head mounting bolts.

Office Action (October 6, 2005), pages 2-3. Applicant submits that this is a conclusory statement that does not identify any rationale for the combination and lacks specific, clear, and particular findings. The Office is merely stating that two of the three references possess certain attributes, and that the combination of these two references (Bock & Zurfluh) with a *third* reference with unspecified attributes (Martin) is obvious based merely on the attributes of the two references. A skilled artisan looking at one reference related to heat dissipation (allegedly Bock) and another reference related to a spacer with orifices (allegedly Zurfluh) would not be motivated to combine these two reference with a third reference with unspecified attributes. If it were proper to do this, Bock and Zurfluh could be combined with *any* reference, even references completely unrelated to internal combustion engines. Since the Office has not alleged reasons why the skilled artisan would select the elements from the cited prior art references for

combination in the manner claimed, the Office has not established a *prima facie* case of obviousness. *See* MPEP § 706.02(j).

The Office's Analysis Uses Impermissible Hindsight

In rebutting Applicant's arguments, the Office states on page 4 of the April 6, 2006 Final Office Action: "Bock has been applied to teach that it was *known to use a spacer having a boss section* that extends along the side of the liner and that this boss section could be used to help dissipate heat." (Emphasis added.) However, Bock does not disclose or teach a spacer having a boss section. In fact, none of the cited references disclose that it was known to have a spacer having a boss section. Simply stating that the current invention was known based on Bock is conclusory and based on hindsight.

As another example, the Office states: "Applicant feels that combining the *boss of Bock* and the spacer (22) of Martin into a one-piece structure would somehow destroy Martin and result in a structure that would teach against Martin." Final Office Action, p4 (emphasis added). However, Bock does not disclose a "boss." Bock discloses a "cooling ring 16," which is not a "boss." Bock does not even use the term "boss" or disclose a similar structure. Using the term "boss" in describing the cooling ring 16 of Bock presupposes that the structure in Bock is the same as in the current invention, and is a hindsight based analysis.

As yet another example, the Office states: "Furthermore, the boss section of element (22) would simply allow seal (40) to be *eliminated or moved further down* the liner, neither of which would destroy the Martin structure." (Emphasis added.) However, *eliminating* seal 40 of Martin, which is titled "*SEAL FOR AN INTERNAL COMBUSTION ENGINE*," would certainly change the structure disclosed and be contrary to the teachings of Martin. Martin, title

(emphasis added). Similarly, absent some teaching that has not been alleged, moving seal 40 of Martin further down the cylinder liner 34 would materially change the disclosed structure, and the only motivation appears to be an effort to create sufficient room to fit a structure similar to that disclosed in the pending application.

Based at least in part on the above, Applicant respectfully asserts that the Office is using the current application as an instruction manual to piece together aspects from the references to render the current claims obvious.

There is No Motivation to Combine The Cited References As Alleged

In contrast to the Office's broad assertion to combine the references, the differences in the references indicate that a person of ordinary skill in the art would not be motivated to combine Martin with Bock and Zurfluh. As an example, Martin and Bock are concerned with different structures performing different functions. Martin is concerned with seals for *preventing* fluid flow within the engine:

The invention relates to an internal combustion engine structure, and addresses the problem of preventing coolant and lubricant from mixing therein.

Briefly stated, the present invention is an apparatus for sealing between the engine block and the cylinder liner in an internal combustion engine.

Martin, Abstract and Column 2, lines 5-7. In contrast, Bock is concerned with a cooling ring *providing* fluid flow within the engine

The configuration of cylinder liner 14, cylinder block 12 and cooling ring 16 co-act to provide effective cooling of cylinder liner 14 within internal combustion engine 10. The dimensions and shapes of the various coolant flow channels 57, 70, 72 and 34 can be shaped and/or sized to provide a flow of liquid coolant at various points adjacent to cylinder liner 14

Bock, Column 4, lines 5-11.

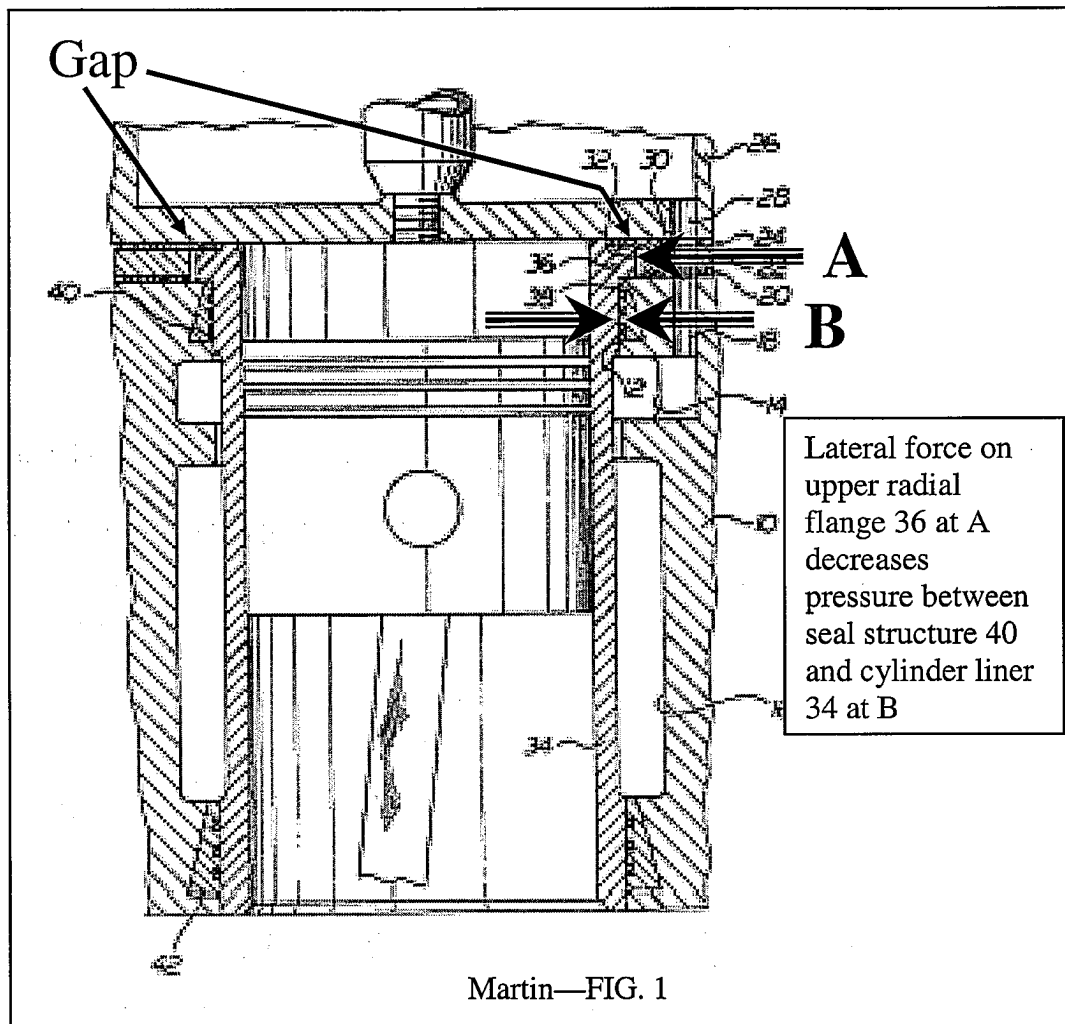
Furthermore, disclosures in Martin actually *teach away* from the disclosures in Bock. For instance, Martin discloses a gap between the upper radial flange 36 of cylinder liner 34 and spacer 22, indicating that spacer 22 does *not* laterally support cylinder liner 34. In fact, a supportive relationship between spacer 22 would be contrary to the teachings in Martin. Any supportive pressure exerted by spacer 22 on upper radial flange 36 (“A” in annotated FIG. 1 *infra*) would decrease the pressure between seal structure 40 and cylinder liner 34 (“B” in annotated FIG. 1 *infra*) and decrease the ability of sealing structure 40 to perform its sealing function. In contrast, Bock’s cooling ring 16 contacts and is capable of providing supportive pressure to cylinder liner 14. *See*, Martin, FIG.1 and Bock, FIG. 1, reproduced and annotated *infra*. As such, the unsupportive spacer 22 of Martin actually teaches away from using the supportive cooling ring 16 of Bock.

When addressing these issues, the Office suggests that combining the cooling ring 16 of Bock with the spacer 22 of Martin would laterally support the cylinder liner 34 of Martin. The Office Action states:

Applicant feels that combining the boss of Bock and the spacer (22) of Martin into a one-piece structure would somehow destroy Martin and result in a structure that would teach against Martin. Such a one-piece structure would instead simply *laterally support the liner of Martin* and allow coolant to flow through the boss instead of through passage (18).

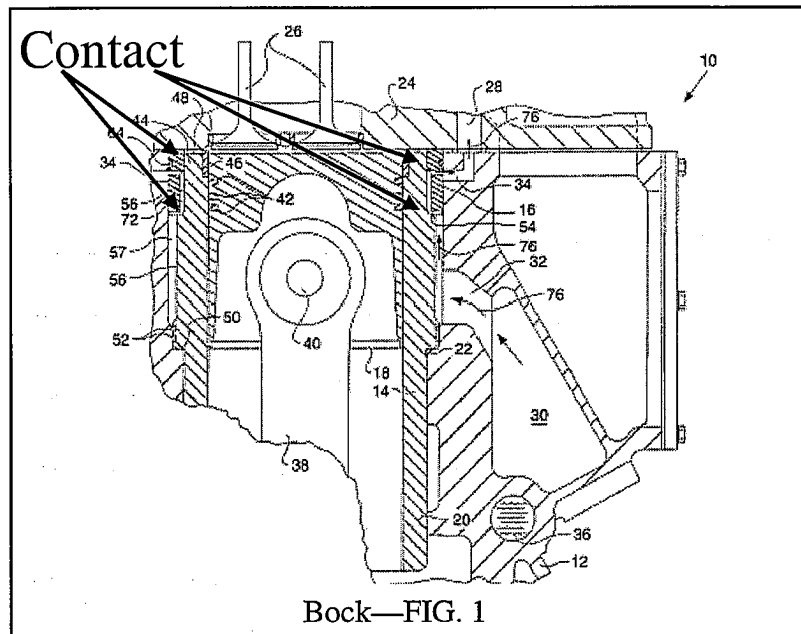
Final Office Action, p4 (emphasis added). First of all, the Office uses the term “boss” in this context. There is no boss in Bock. The part 16 in Bock is a separate and distinct ring, not a boss. Secondly, the liner 34 of Martin is *not* laterally supported by spacer 22, nor does Martin disclose that laterally supporting liner 34 is desirable. In fact, as discussed above, the teachings of Martin indicate that spacer 22 should *not* laterally support liner 34. In the absence of Applicant’s

disclosure, how and why would anyone propose such a thing? Again, the Office's reasoning appears to be based on impermissible hindsight.



As still another example of there being no motivation to combine the references, Bock and Zurfluh are concerned with different structures performing different functions in different parts of the engine. Bock is concerned with a cooling ring with radial coolant passages positioned between the cylinder liner and the engine block. Bock, abstract and FIGS. 1-3. In contrast, Zurfluh is concerned with a planar, steel gasket positioned between the cylinder head and the block. Zurfluh, abstract and FIGS. 1, 5 and 6.

In view of the above, Applicant respectfully asserts that, even in the light of Applicant's disclosure, there is no suggestion or motivation, either in the references themselves, or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings as alleged or in any other way.



There Is No Motivation to Make a Single-Piece Structure As Alleged

Even assuming arguendo that a proper motivation to generally combine Martin with Zurfluh and Bock exists, there is no motivation in either Martin, Zurfluh or Bock to combine Martin's spacer 22 and Bock's cooling ring 16 into a single-piece structure, as alleged. In fact, physically combining Martin's spacer 22 with the Bock's cooling ring 16 would defeat a primary motivation behind at least one reference. For example, Martin is concerned with sealing the connection between the cylinder liner and the cylinder block, thereby preventing the flow of fluid between the cylinder liner 34 and the engine block 10:

Briefly stated, the present invention is an apparatus for sealing between the engine block and the cylinder liner in an internal combustion engine.

Martin, Column 2, lines 5-7.

In contrast, Bock is concerned with providing fluid flow between the cylinder liner 14 and the cylinder block 12.

The liquid coolant travels in the annular channel 57 around cylinder liner 14 in a direction generally toward cooling ring 16. The liquid coolant then flows through the flow passages 70 between projection 68 and into the annular coolant channel 72 between second inside diameter 60 and cylinder liner 14. The liquid coolant then flows in a radial direction through radial coolant passages 74 and into branch channels 34 [within cylinder block 12] which connect with other appropriate flow channels, such as a channel 28 in cylinder head 24. The general flow directions of the liquid coolant adjacent to cylinder liner 14 and around cooling ring 16 are indicated generally by arrows 76.

Bock, Column 3, lines 56-67. *See*, Bock, FIG. 1, reproduced *supra*. Combining Martin with Bock would necessitate either allowing fluid flow between the cylinder liner and the block or restricting fluid flow between the cylinder liner and block, thereby resulting in a structure that is contrary to the teachings of at least one of the references.

No Reasonable Expectation Of Success Exists

Furthermore, the structures disclosed in Martin and Bock cannot be combined into an operable single-piece structure, as alleged, without radical modification to the teachings and structures disclosed in at least one of Martin and Bock. For example, Martin discloses a non-contacting relationship (a gap) between spacer 22 and cylinder liner 34 while Bock discloses a contacting relationship between cylinder liner 14 and cooling ring 16. *See* Martin, FIG. 1 and Bock, FIG. 1, reproduced *supra*. To physically combine Martin's spacer 22 with Bock's cooling ring 16 would require a modification of at least one of the structures that is certainly not disclosed or suggested in either reference.

As another example of the radical modifications required to combine Martin and Bock into a single-piece structure, Martin's spacer 22 is located atop metallic gasket 20, where metallic gasket 20 is on top of cylinder block 10, and accommodates a cylinder liner with an upper radial flange 36 that extends above the cylinder block 10. *See* Martin, FIG. 1, reproduced *supra*. Conversely, Bock's cooling ring 16 is located at or below the gasket on top of the cylinder block 12 and does not accommodate a cylinder liner with an upper radial flange that extends above the cylinder block. *See* Bock, FIG. 1, reproduced *supra*. Not only would extensive modification of at least one of the structures in either Bock and Martin be required to combine the two into a single-piece structure, but it is difficult to imagine the precise structure that would result from the combination of Martin's spacer 22 and Bock's cooling ring 16 without violating the teachings of either reference.

The Ford (U.S. Patent No. 2,279,671) and Ishida (U.S. Patent No. 6,336,639) references do nothing to change the lack of applicability of the references discussed above.

Secondary Considerations Indicate The Present Invention Is Not Obvious

As is well known, secondary considerations, such as solving a long-felt need, can be additional evidence that a claimed combination is not obvious. "[D]eclarations containing evidence of ... long-felt but unresolved needs [and] failure of others ... must be considered by the examiner in determining the issue of obviousness of claims for patentability under 35 U.S.C. 103." MPEP § 716.01(a). "[S]econdary considerations, such 'as ... long felt but unresolved needs, failure of others, etc.' ... provide objective proof of nonobviousness." *Al-Site Corp. v. VSI Int'l, Inc.*, 174 F. 3d 1308, 1325 50 USPQ2d 1161, 1172 (Fed. Cir. 1999) (*citing, Dennison Mfg. Co. v. Panduit Corp.*, 475 U.S. 809, 810 (1986)). Evidence of secondary considerations

must be thoroughly evaluated. *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 307 (Fed. Cir. 1985) (“The opinion rendered by the district court did not discuss these secondary considerations, ... and they apparently were not accorded any probative value or entered into the final calculus on the issue of obviousness/ nonobviousness. This was error as a matter of law.”). “Appreciation by contemporaries skilled in the field of the invention is a useful indicator of whether the invention would have been obvious to such persons at the time it was made.” *Vulcan Engr. Co., Inc. v. FATA Aluminum, Inc.*, 278 F.3d 1366, 1373, 61 USPQ2d 1545, 1548 (Fed. Cir. 2002), *cert. denied*, 123 S. Ct. 81 (2002).

Applicant respectfully submits three declarations by professionals in the automotive industry and a copy of a webpage article from POWER & PERFORMANCE NEWS posted December 22, 2005, attached as Exhibits A-D, respectively. The statements of Judson Massengill, Chuck Mallett, and Brian Nutter—three experts in the “after-factory” modification of automotive engines industry—and the article, indicate strong professional recognition and approval of the commercial embodiment of the present invention and that the present invention provides advantages which satisfy long-felt needs in the industry that others had failed to solve.

Mr. Massengill, whose statement is attached as Exhibit C, has worked in the performance automobile industry for approximately forty (40) years, is the owner and founder of the nationally recognized and accredited School of Automotive Machinist (<http://www.samracing.com>), a member of the Society of Automotive Engineers (SAE), and a National Institute for Automotive Service Excellence (ASE) certified machinist. Mr. Massengill states that there has been a long-felt need in the industry for the ability to reliably replace original cylinder sleeves with larger sleeves while avoiding problems such as overheating and distortion of engine components. Mr. Massengill also states that others, for example those using

